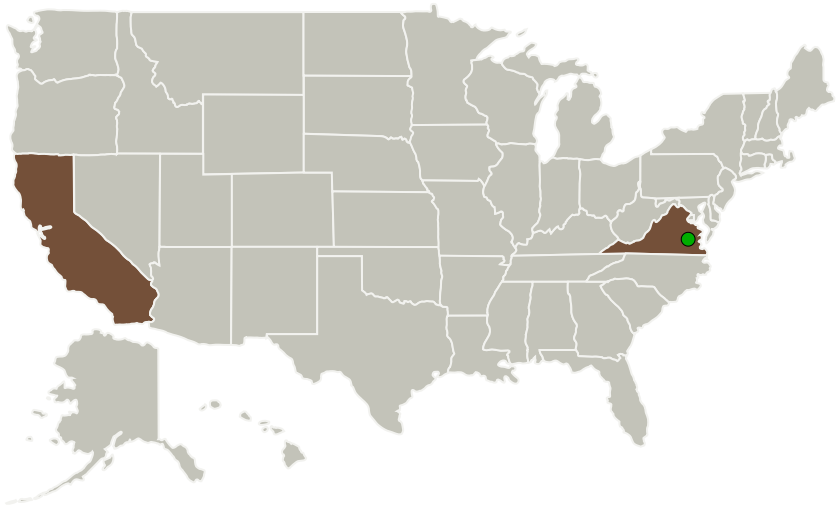
High Energy Single Frequency Resonant Amplifier, Phase I

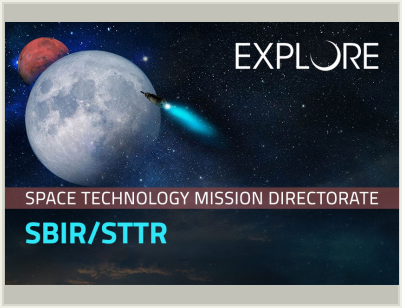
Completed Technology Project (2011 - 2011)

Project Introduction

This SBIR phase I project proposes a single frequency high energy resonant amplifier for remote sensing. Current state-of-art technologies can not provide all features of high energy and efficiency, compactness, and narrow spectral width. PolarOnyx proposes, for the first time, a high energy (100 mJ) resonant amplifier to meet with the requirement of solicitation. This proposal is based on the spectral shaping sub-mJ fiber laser at 1550 nm we have achieved in our labs. In the high power amplifier stage, PolarOnyx proposes an innovative resonant cavity based amplifier approach by employing our patent pending proprietary technologies in hybrid high energy amplifiers, that will be able to operate at low repetition rate (10's Hz to 1 kHz) and reach high energy level of 100 mJ. These will make the hybrid fiber laser transmitter system superior in terms of wall plug efficiency (over 30%), energy(100 mJ), noise, size, and cost. A tabletop experiment will be demonstrated in Phase I time frame for proof of concept. A compact prototype will be delivered in Phase II.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Polaronyx, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	San Jose, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

February 2011: Project Start

August 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138199)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Polaronyx, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

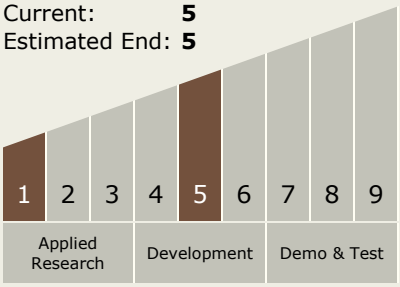
Carlos Torrez

Principal Investigator:

Jian Liu

Technology Maturity (TRL)

Start: **1**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System